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Alcohol use and abuse among college women:

A one-year follow-up study

by

Jennifer Lynne Miller

A dissertation submitted to the graduate faculty

in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Major: Psychology (Counseling Psychology)

Major Professor: Carolyn E. Cutrona

Iowa State University

Ames, Iowa

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Iowa State University**

**This is to certify that the Doctoral dissertation of
Jennifer Lynne Miller
has met the dissertation requirements of Iowa State University**

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INTRODUCTION

Problems related to alcohol use are very prominent on college campuses. Two tragic deaths were in the news recently that underscored the problem of drinking at universities. In August 1997, Benjamin Wynne became a full member of his fraternity at Louisiana State University. The twenty year-old proceeded to celebrate by drinking large quantities of alcohol with his brothers. The next morning, police found approximately two dozen men passed out on the fraternity floor. Three of them had to be hospitalized for alcohol poisoning, and Wynne was found dead. His blood-alcohol level was six times the legal limit, the equivalent of about 24 drinks (Cohen, 1997). Three weeks later, a freshman at the Massachusetts Institute of Technology drank himself to the point of unconsciousness and never woke up (Schroth, 1997).

College students nationally tend to drink more heavily than their same-age peers (Johnston, O'Malley, & Bachman, 1991). While some researchers (Engs & Hanson, 1988; Gonzalez, 1990) would argue that alcohol use has not really changed over the last decade, alcohol-related stories are still highly visible in newspapers and other media. For example, on the ISU campus, alcohol abuse has become a focal point for the administration, as evidenced by recent changes to the campus alcohol policy and increased sanctions for both on- and off-campus students who violate this policy.

Researchers have recently turned their attention to female college drinkers (Lo, 1995; O'Hare & Tran, 1997; Thombs, 1993; Werner, Walker, & Greene, 1994b; Weschler et al., 1995). Their findings suggest that negative consequences of alcohol use are becoming more of a problem for this subset of the college population. In addition, there are a number of biological, psychological, and social factors that place women at a higher risk for developing

problems with alcohol--at a faster pace and/or at smaller amounts than men typically incur problems (Blume, 1990; Frezza et al., 1990; Johnson, 1991; Ray & Ksir, 1987; Whitehead & Layne, 1987).

This study will follow female college students over the course of one year. It will focus on identifying those women whose drinking appears to place them at risk for developing alcohol-related problems, and will compare them to a group of women whose drinking is less problematic. The goal of this study is to identify patterns in behavior that not only differentiate between the two groups, but that might point to longer-term problems. I will first discuss some general issues concerning alcohol use and abuse, and will then address the issue of why college women are such a high-risk population.

LITERATURE REVIEW

Alcohol and the American culture

Alcoholic beverages have been used for several thousand years. Different cultures have endorsed varying levels of alcohol use, ranging from drunkenness to “everything in moderation” to abstinence. American culture seems to have generally adopted a laissez-faire view of alcohol use. The college culture in particular has embraced this philosophy in the past, condoning underage drinking as well as weekly binge drinking (drinking five or more drinks in one sitting) as long as no one gets hurt. Many high school students expect college to be like the movie, “Animal House”—just one big party with a lot of drinking and little accountability. And, to some degree, they are correct: college campuses have consistently been known for high levels of alcohol abuse, regardless of the legal drinking age.

Several college campuses and communities have tightened their alcohol policies, making it more difficult for underage drinkers to acquire alcoholic beverages, and increasing the fines and penalties for alcohol-related offenses. College fraternities, long associated with heavy drinking (Lichtenfeld & Kayson, 1994), may be facing some major changes in the next few years. Two fraternities, Sigma Nu and Phi Delta Theta, announced in March 1997 that their chapters nationwide would be “dry” by July of 2000. While some individual chapters are already alcohol-free, these two fraternities were the first to make it a national policy (Walthall, 1997). All 26 national sororities have been alcohol-free for years. The costs are becoming too great for some campus organizations to allow alcohol on their premises. Serving alcohol on the premises apparently makes up 80 percent of the liability insurance premiums for fraternities (“Raise a”, 1997). Yet there has been very little

improvement in the number of college students who have experienced overdoses and other negative consequences of alcohol use. There have been approximately 25 verified cases of students who have died from alcohol poisoning in the last twelve years, with six of these deaths occurring in the 1996-1997 school year alone (Schroth, 1997; Walthall, 1997).

National statistics for the general population show an increase in alcohol poisoning deaths; in 1995 there were 3,835 verified alcohol overdoses, up from 3,789 in 1994 and 3,640 in 1993 (National Safety Council, 1998). And, while fatalities from alcohol-related car accidents have decreased by 26 percent in the 1986-1996 decade, drinking and driving is still a very large problem. It is estimated that the cost of alcohol-related vehicle accidents was \$28.6 billion in 1997 (National Center for Statistics and Analysis, 1997). During their lifetime, nearly 30 percent of all Americans will be involved in a vehicle accident that was due to alcohol use (National Safety Council, 1998).

Definitions of abuse and dependence

The Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV; APA, 1994) has established criteria for alcohol abuse and alcohol dependence. Criteria for alcohol abuse include occupational and social dysfunction, engaging in dangerous drinking behavior, frequent legal troubles, and/or continued use despite these problems. Criteria for dependence include increased tolerance, withdrawal symptoms, difficulty regulating use, neglect of other areas of one's life, and persistent use of alcohol despite negative consequences. See Tables 1 and 2 for a complete listing of the DSM-IV criteria.

Table 1. DSM-IV criteria for alcohol abuse.

-
- A.** A maladaptive pattern of alcohol use leading to clinically significant impairment or distress, as manifested by one (or more) of the following, occurring within a 12-month period:
1. recurrent alcohol use resulting in a failure to fulfill major role obligations at work, school, or home (e.g., repeated absences or poor work performance related to alcohol uses; alcohol-related absences, suspensions, or expulsions from school; neglect of children or household)
 2. recurrent alcohol use in situations in which it is physically hazardous (e.g., driving and automobile or operating a machine when impaired by alcohol)
 3. recurrent alcohol-related legal problems (e.g., arrests for alcohol-related disorderly conduct)
 4. continued alcohol use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of alcohol (e.g., arguments with spouse about consequences of intoxication, physical fights)
- B.** The symptoms have never met the criteria for Alcohol Dependence.
-

Note: taken from DSM-IV, pg. 182-183, 196

Table 2. DSM-IV criteria for alcohol dependence.

-
- A maladaptive pattern of alcohol use, leading to clinically significant impairment or distress, as manifested by three (or more) of the following, occurring at any time in the same 12-month period:
1. tolerance, as defined by either of the following:
 - a. a need for markedly increased amounts of alcohol to achieve intoxication or desired effect
 - b. markedly diminished effect with continued use of the same amount of alcohol
 2. withdrawal, as manifested by either of the following:
 - a. the characteristic withdrawal syndrome for alcohol
 - b. the same (or a closely related) substance is taken to relieve or avoid withdrawal symptoms
 3. the alcohol is often taken in larger amounts or over a longer period than was intended
 4. there is a persistent desire or unsuccessful efforts to cut down or control alcohol use
 5. a great deal of time is spent in activities necessary to obtain alcohol (e.g., driving long distances), use the substance, or recover from its effects
 6. important social, occupational, or recreational activities are given up or reduced because of alcohol use.
 7. the alcohol use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the alcohol (e.g., continued drinking despite recognition that an ulcer was made worse by alcohol consumption)

Specify if:

With Physiological Dependence: evidence of tolerance or withdrawal

Without Physiological Dependence: no evidence of tolerance or withdrawal

Note: taken from DSM-IV, p.181, 195-196.

As one might imagine, it is not very difficult for a “normal” binge-drinking college student to meet the criteria for alcohol abuse. Alcohol dependence, on the other hand, tends to require more time to establish. Individuals may be eligible for these diagnoses through many different routes. Let us compare two college students. One drinks once a week, on a

weekend night, but always drinks to excess and frequently cannot remember what he/she did after drinking. Another student drinks only two or three beers, but drinks almost daily because he/she needs alcohol to relax. Which one of these students has a problem? Both do—but they have developed problematic drinking patterns in different ways. This high degree of variability in how one can define “problem drinking” makes it difficult for the clinician to know who is at risk for developing alcohol dependence.

Another difficulty for clinicians working with a college population is that some theorists believe that alcohol abuse is developmentally normative (Zucker et al., 1997). Many college students engage in heavy drinking over the course of their college career, yet few become problem drinkers. This suggests that alcohol abuse may simply be a developmental “phase” that many college students go through during a time in their life that is relatively free of responsibility. The insulated microcosm of a college campus may also make it safer for students to drink without having to face the additional repercussions of alcohol violations in the community.

Demographic and Personal Factors Associated with Alcohol-Related Problems

In this section, I will cover the demographic and personal factors that are associated with problem drinking. All of these factors, including age, ethnicity, living arrangements during college, knowledge of alcohol, family history and societal factors have been shown to significantly affect one’s likelihood of developing problems related to alcohol use.

Age

Three aspects of age have been studied: age of first drink and/or intoxication, current age, and the legal drinking age. Werner, Walker, and Greene (1994a) asked college

freshmen to report the age at which they first drank alcohol. They found a significant positive correlation between age of first drink and amount and frequency of current alcohol consumption. There was also a significant positive association between age of first drink and current alcohol-related problems. Deisinger, Cychosz, and Borgen (1991) found that both age of first drink and age of first intoxication predicted alcohol use in a sample of 410 college students.

Other studies have compared the drinking behaviors of people at different ages. Most studies have shown that alcohol abuse is more prevalent in adolescents (ages 13 to 17) than in young adults (ages 25 to 30) (Bachman et al., 1987; Clark, 1983). Klein (1994) demonstrated that there is a developmental component to some college students' drinking style. In a survey of 526 students, his results showed that, for female college students, the amount of alcohol consumed in any 24-hour period, the frequency of intoxication, and the number of negative consequences related to alcohol all decrease over the course of their college career. Men, however, seem to experience a "protracted adolescence" (p.251) during their time in college, as their abuse of alcohol does not change. Lichtenfeld and Kayson (1994) also studied the effect of age on drinking-related problems. They divided their sample into two groups: under 35 years of age and age 35 and over. Results showed a significant negative association between age and number of problems related to drinking behavior, with people under the age of 35 reporting more alcohol-related problems than their older counterparts. There was also a significant interaction between current age and Greek affiliation. Younger students who were involved in a fraternity or sorority cited more negative consequences of alcohol use than same-age students who were not affiliated with the Greek system did.

Studies on the effects of legal drinking age (either age 18 or 21) on alcohol-related problems have also been conducted. The theory behind imposing age restrictions on drinking is that limiting the legal accessibility of alcohol to minors should limit the amount of alcohol they can ingest. By limiting the amount, it should also reduce the number of negative consequences of alcohol for that group (i.e., traffic fatalities, irresponsible drinking, academic decline, etc.). O'Hare (1990) looked at whether raising the legal drinking age to 21 was related to any change in drinking among minors. He found that there was essentially no difference among college undergraduates in the consumption of alcohol by minors versus "legal" drinkers, although there was some difference in where the two groups of students engaged in drinking. Students who were of legal age were more likely to drink at bars, at a restaurant, alone, or with one member of the opposite sex, while underage drinkers were more likely to drink with their family members. There was also no significant difference in the number of negative consequences minors and of-age drinkers encountered relative to their drinking. Thus, it would appear that the legal drinking age has minimal, if any impact on alcohol use by college students.

Ethnicity

Several studies have examined race as a demographic predictor variable, and the results have been quite consistent. Generally, European-Americans, particularly males, engage in the heaviest drinking in college, relative to African-Americans and Hispanics/Latinos (O'Hare, 1990; Thombs, 1991). It is likely that this reflects the fact that European-Americans comprise a majority of the college populations studied. However, other studies that have looked at the general population have found different results. For example, Caetano and Clark (1998) looked at trends in drinking and alcohol problems among a large

sample of European-Americans, African-Americans, and Hispanics/Latinos over an 11-year time span. Results showed a relatively stable number of alcohol problems in both the European-American and African-American sample, but a rather substantial increase of alcohol problems for Hispanics/Latinos. In addition, alcohol-related problems among African-Americans tended to be higher than in the European-American population. This would suggest that European-Americans are actually at less risk than minorities in the general population, though not during the college years.

Type of college residence

Several researchers have looked at the impact of campus living arrangements on drinking behavior. It has been assumed by many that men who are affiliated with fraternities are at higher risk for developing problems with drinking, as this is the segment of the college population that tends to be most associated with heavy drinking. Baer, Stacy, & Larimer (1990) studied perceptual biases of drinking behavior among college students. Students reported the perceptions that fraternity members drink the largest amount of alcohol in a weekly period, followed by sorority members. Students who were not affiliated with the Greek system were perceived as drinking the least.

Researchers have focused on Greek affiliation as a potential risk factor for drinking. Saltz and Elandt (1986) found that problem drinkers tend to be affiliated with either a fraternity or sorority. Thombs (1991) found similar results for Greek affiliation/living arrangement in his survey of 1148 undergraduates. Another study (Werner & Greene, 1992) found that intent to become a member of either a fraternity or sorority was positively associated with frequent drinking and frequent binge drinking. Lichtenfeld and Kayson (1994) looked at age and Greek membership and found a significant interaction between the

two. They contend that membership in a sorority or fraternity seems to be related to higher consumption and drinking frequency only in the younger members. Deisinger and Cychosz (1994) found that a distinction needed to be made between Greek affiliation and Greek residence. They found that for those affiliated with and living in a fraternity or sorority consumed more alcohol than those who were affiliated with the Greek system but residing elsewhere.

A second comparison in the literature concerns students who live on- versus off-campus. O'Hare (1990) compared on-campus residents' drinking behaviors with those of commuter students. Findings indicated that those students who lived on campus tended to be heavier drinkers than their commuting counterparts. Commuter students who still lived at home with their parents were the least likely to be heavy, problematic drinkers, and were most likely to abstain from drinking altogether. Commuter students who lived on their own seemed to drink more than commuters living with their families, but not nearly as much as on-campus dwellers.

Saltz and Elandt (1986) found that problem drinkers tended to live in off-campus apartments, which makes sense considering the fact that students who live in off-campus apartments are still very close to campus activities and nightlife, while commuters may not be. To summarize the findings of the literature, then, those who are affiliated with a Greek organization are most at risk, followed by either off-campus apartment dwellers (Saltz & Elandt, 1986) or on-campus students (O'Hare, 1990). Commuter students who live on their own show fewer problems, and the least number of risks/problems were experienced by students who still live at home. An interesting exception came out of O'Hare's (1990) study when he examined the data separately by gender. Males living on campus were twice as

likely to be heavy drinkers than commuting males, either living on their own or with their families. For women, however, commuters living independently tended to be the heaviest drinkers, often drinking more than on-campus females.

Knowledge about alcohol

Another factor that may influence college students' consumption of alcohol is their level of education about alcohol. Researchers have speculated that education about the strength of different alcoholic beverages may reduce excessive drinking (Martin et al., 1991). Most studies have demonstrated a lack of awareness among students regarding differences in strength of beers, wines, and liquors. Why is this a problem in the United States, where all alcoholic beverages are required to have this information on the bottle? To begin with, labeling requirements are slightly different among the various types of alcoholic beverages, and sometimes the alcohol content is difficult to find. Secondly, the concentration or strength of different beverages is measured in different ways. With distilled spirits, the strength is measured in "proof". Proof ranges from zero to 200, and is always twice the amount of alcohol per volume. For example, liquor that is labeled as 80 proof is 40 percent alcohol. Wines are also measured by percent of alcohol per volume, but not labeled with "proofs." Beers, on the other hand, are measured by percent alcohol by weight, not volume. In addition, imported beers' alcohol concentration is measured in different ways, leading to different strengths than domestic beers (Jackson, 1988).

These discrepancies among measurement techniques can make deciding which type of alcohol is the "weakest" a confusing task. Shore (1985) interviewed women and men regarding the concentration of alcohol and found that 36 percent of them thought that a beer, a glass of wine, and a shot of hard liquor contained different amounts of alcohol when, in

fact, they contain roughly the same amount. Related to this finding are results from an older study conducted by Buckalew (1979). He asked subjects to evaluate the dangerousness of certain alcoholic beverages. Respondents typically rated beer as the least dangerous, followed by wine. Distilled spirits were identified as the most “dangerous” type of alcohol. Martin et al. (1991) surveyed 113 college students regarding their awareness of the content of different alcoholic beverages (i.e., malt beverages, wines, fortified wines, and distilled spirits). The results were quite astounding; the rates of correct responses were well below 50 percent for all categories. In addition, no single subject was able to correctly identify the concentration of all four types of alcoholic beverages. Men’s estimates of concentration tended to be more accurate than women’s. Ironically, those who drank more frequently tended to underestimate the strength of certain alcoholic beverages. Finally, having a preference for a particular alcoholic beverage did not affect the subject’s knowledge of alcohol content. These results suggest that there is a great deal of ignorance surrounding the strength of alcoholic beverages. In my experience working in the substance abuse intervention program, most college students still believe that beer is safer to drink than hard liquor because it will not make them as intoxicated as liquor will.

Family history

One of the most widely researched phenomena in the alcohol literature is whether individuals with a family history of alcohol abuse or dependence are more prone to have problems with alcohol themselves. Williams and Corrigan (1992) state that one out of every eight children in the United States comes from a family with alcohol-related problems. They assert that children who live with an alcoholic parent suffer more self-esteem and anxiety problems than those raised by a mentally ill caregiver. It is generally accepted in the

literature that children of alcoholics (COAs) are at an increased risk for developing problems related to alcohol (Russell, 1990).

Lichtenfeld and Kayson (1994) surveyed college students about their own problems related to alcohol, as well as whether someone in their family had drinking-related problems. They found that individuals who had an immediate family member with a drinking problem were more likely to have alcohol-related problems themselves than those who had no relatives with drinking problems. Perkins and Berkowitz (1991) also found that individuals with a family history of alcohol abuse were more likely to abuse alcohol themselves. Numerous other studies (Barnes & Welte, 1990; Bradley, Carman, & Petree, 1992; Buelow, 1995) have yielded similar results.

The issue of family history's influence on drinking behaviors in young adults is hardly resolved, however. For every study that finds increased rates of alcohol-related problems in children of individuals with a drinking problem, there are just as many that find no significant effect of a parent's drinking style on his/her child. Werner, Walker, & Greene (1994a) found no correlation between adolescents' drinking-related problems and their reports of family drinking styles or their scores on the Children of Alcoholics Screening Test. Havey and Dodd (1993) found no association between COA status and either the prevalence or severity of problems associated with alcohol. Engs' (1990) study had comparable findings.

In conclusion, it would appear that the presence of a family member with alcohol-related problems may or may not have alcohol-related implications for the child. While some theorists have contended that parental behavior serves as a model for their children (Lichtenfeld & Kayson, 1994), others have demonstrated that substance abuse by parents

may actually serve as a negative model for children (Blanton et al., 1997). Pandina and Johnson (1990) have summarized these findings nicely, stating that the presence of a family history of alcohol problems “is not, in and of itself, a sufficient predictor of vulnerability” but that the absence of familial alcohol abuse “does not provide a sufficient inoculation against substance abuse problems” (p. 282).

There are other issues to consider regarding the effects of family history on children’s drinking behavior. First, the majority of the above studies looked at college students’ reported drinking behavior. Alcohol dependence is a disorder that generally does not appear until the 20’s through mid 30’s in a person’s life (DSM-IV, APA, 1994). Thus, it is likely that most of the students surveyed in these studies have not yet developed any serious drinking problems. In addition, as mentioned earlier, some believe that adolescent drinking patterns are relatively transient (Zucker et al., 1997). Some students who drink heavily during college will go on to become alcoholics. Others will not. These studies that fail to find an effect for family history among young adults do not speak to the issue of whether family history has a *long-term* effect.

Social factors in alcohol use

Family and friends can influence one’s drinking behavior in several ways. Parish and Parish (1991) surveyed college students regarding their current use of alcohol, their self-concept, and failures in their social support system throughout their life. “Failures” included divorce or death of parents, financial hardship, hostile family environment, and lack of support among one’s peers. The results indicated that those college students classified as nondrinkers had significantly less peer support than drinkers did. Conversely, non-drinkers

reported a stronger self-concept than heavy drinkers did. The authors suggest that these findings support the concept that students with low self-esteem may drink in order to gain support and acceptance from their friends and peers. Those with more positive self-concepts may feel less pressure to drink around others. Such motivation to drink could be important in finding appropriate interventions, as most college drinkers consume alcoholic beverages with their friends and/or peers.

Family and friends can also influence one's perceptions of drinking as well. An area that has been well studied in the field of health psychology is prototype development. Prototypes are mental representations of individuals that people use to represent good and bad qualities. For example, most people have a prototypical image of "criminal" or "typical smoker" in their mind. The theory behind prototypes is that individuals adopt or discard certain risky or healthy behaviors according to which prototypes are considered favorable for them. These prototypes do not necessarily have to be positive, only more positive relative to others' perceptions of that prototype. In other words, if a person has a prototype of a smoker that is more positive than others around him/her, then he/she will be more likely to smoke than his/her peers. Research in this area has typically shown that one's family and friends can influence the valence of one's prototypes. Blanton et al. (1997) investigated whether family and peers affect the development of prototypes associated with substance use. They found that adolescents who had friends who used substances (and encouraged substance use among others) had more positive prototypes of drinkers and smokers. Consequently, these positive prototypes predicted both alcohol and cigarette use.

College Women

Biological and physical factors

Why are college women particularly at risk? There are several reasons. First, women are at a distinct disadvantage biologically. They are normally smaller in size than men, and body weight is a powerful determinant of how much alcohol one can process. In addition, women have been shown to have less of a metabolizing enzyme in their stomach lining, which makes them less efficient metabolizers of alcohol (Frezza et al., 1990). This means that alcohol will stay concentrated in a woman's system longer than in a man's. If absorption rate, weight, tolerance/drinking experience, and amount of food in the stomach are equal, women's blood/alcohol concentrations are still approximately 20 percent higher than men's are if they drink the same amount of alcohol (Ray & Ksir, 1987). Women's tolerance to alcohol also seems to be affected by hormonal changes. Menstruation and/or taking birth control pills can make women's bodies more sensitive to the effects of alcohol. This fluctuation in sensitivity to alcohol can make it difficult for women to estimate how alcohol is going to affect them on any given day (Johnson, 1991). Another problem is that alcohol is soluble in water. Women tend to have more fat and less water in their bodies than men do, which can lead to higher blood/alcohol concentrations in females (Blume, 1990). All of these factors contribute to women being very vulnerable to the effects of alcohol. Wechsler et al. (1995) conducted a survey of over 17,000 college students from 140 different colleges in the United States. They focused on the number of negative consequences related to binge drinking in both male and female students. The data revealed that, at the same number of drinks, women experience more problems related to their alcohol use than men do. Alcohol-related problems included having a hangover, missing a class, getting in an argument, having

unplanned or unsafe sex, forgetting part of the evening, falling behind in school, experiencing regret for one's behavior while drinking, and personal injury. Based on their results, these authors argue that there should be gender-specific definitions of binge drinking. They recommend that the current definition of binge drinking (five or more drinks in one occasion) be used for men only, and that, for women, the drink amount should be reduced to four.

Social and psychological factors affecting female drinkers

There are social factors that have an impact on the prominence of female drinkers, including an increased acceptance of women drinking. Prior social norms seemed to be accepting of men drinking and/or getting intoxicated, but viewed female drinkers in a negative light (Plant, 1980). Now, in the age of increased equality, society has either become more comfortable with female drinkers, or female drinkers are finding it easier to bring their drinking problems to light (Hoar, 1983). Unfortunately, this can lead to problems, including encouraging women to "keep up with" the men in drinking games.

Another psychological phenomenon that is not new but perhaps has received more attention is the use of alcohol to escape from stress or to self-medicate. Older studies (Hoar, 1983; Wilsnack, 1973) state that, compared to men, women who become alcoholics have experienced more family of origin problems, and are more likely to drink in response to environmental stressors. Wilsnack (1973) found that women were more likely than men to drink to relieve tension or anxiety, or to forget about worries and concerns. Walitzer and Sher (1996) have found that low self-esteem plays a larger role in the development of alcohol disorders in women than it does for men. Other studies (Kendler et al., 1993; Nunes, Quitkin, & Berman, 1988) have found increased comorbidity in alcoholic women. Female

alcoholics have much higher prevalence rates of panic disorder and major depression than is found in the general population. It is very likely that these women turned to alcohol to alleviate some of these anxious and depressive symptoms. These studies indicate that psychological and environmental factors play a fairly large role in the development of problem drinking among women.

Genetic factors

While the heritability of alcoholism in men has been recognized for quite some time, women's risk of developing alcoholism through genetic channels has only recently been studied. Several twin and adoption studies have established the genetic risks in males from alcoholic families in the U.S. (Heath et al., 1997; McGue, 1994; Reed et al., 1996; True et al., 1996), but a genetic link in women was either not as strong or nonexistent (Cadoret et al., 1985; McGue, 1994). It has therefore been assumed that men are at an increased risk for being genetically predisposed toward alcoholism if they have a family history, while women are not at risk. However, research since 1983 (Cloninger, 1983; Heath et al., 1997) has demonstrated that women with a family history of alcoholism are as much at risk for developing problems with alcohol as men are. Kendler et al. (1993) studied over 1,000 female-female twin pairs and their parents and found heritability rates from 51 to 59 percent. In addition, their results suggest that alcoholism was only passed genetically to the female offspring, not through environmental conditions, such as living with an alcoholic parent. While this phenomenon of genetic, not environmental, transmission has been found in initial studies of men, later findings have indicated that environment does increase the risk of alcoholism in men (Cadoret, Troughton, & O'Gorman, 1987). Finally, while women seem to be as vulnerable to genetic influences of alcoholism as men are, they have been shown to

become problem drinkers much more quickly and at much lower quantities than men do (Whitehead & Layne, 1987). Certainly more research focusing on women's drinking patterns is warranted.

The Proposed Study

The main question I wish to answer is the following: is heavy drinking during the early college years a relatively harmless phase for college women, or does it lead to significant problems that may have longer-term consequences in their lives? A survey was conducted during mass testing last spring that included, among other things, information about students' drinking patterns. Part of the survey on drinking behavior addressed the symptoms of alcohol abuse, as defined by the DSM-IV (APA, 1994). I have conducted a follow-up study on two groups of women from the mass testing sample: those who met the criteria for alcohol abuse last year, and a matched sample of women who did not. In addition, a sample of women who have come to Student Counseling Services (SCS) for substance abuse assessments over the last year were evaluated. While some of these women were self-referred, most were required to complete an assessment due to a judicial sanction, such as being charged with Public Intoxication, Minor in Possession, etc.

Although my study will be limited to problems that have occurred over the course of one year, the results may point to longer-term trends. At the one-year follow-up, I predict that women who met the criteria for alcohol abuse one year ago will drink more, in terms of frequency and/or amount, than the control group. In addition, I predict that women who met the criteria for alcohol abuse will report more problems than the control group in at least one

of these areas: academics, alcohol-related physical effects, social problems, emotional problems, sexual behaviors, and/or legal problems.

I expect that these data will also replicate findings in the literature on the effects of living arrangement on college drinking. Therefore, women who belong to sororities at ISU will probably drink more than independent women will. Women who live independently off-campus will likely drink more than their on-campus counterparts, reflecting O'Hare's (1990) findings.

Women who were referred to SCS for alcohol-related violations were included in the comparisons. No specific predictions will be made regarding their drinking behavior relative to the other two groups. Although these women violated alcohol policies, there is much variability in their drinking patterns.

MATERIALS AND METHODS

Participants

A large sample of college students (N= 637) participated in a mass testing exercise in spring of 1998. Women comprised 51.5 percent of the original sample (N=323). Most of the women described themselves as being of European descent (91%), but African-Americans (2.5%), Southeast Asians (individuals from China, Japan, Vietnam, etc.; 3.1%), and South Asians (individuals from India, Pakistan, Turkey, etc.; 1.2%) were also represented. Approximately two-thirds of the women (65.9%) were freshmen at the time of the initial survey, and 20.4 percent were sophomores. Almost one-fourth (24.1%) reported an affiliation with a Greek organization. Grade point averages were typically in the average to high range, with 83 percent reporting g.p.a.s of 2.25 or greater.

From this sample, two groups of women were recruited based on their drinking behavior. The first group was comprised of women who met the DSM-IV criteria for alcohol abuse (APA, 1994, p. 182-3, 196), based on responses they made on a drinking questionnaire that was contained within the mass testing survey. A total of 115 women (35.6%) met the criteria for substance abuse in 1998. A second sample of females who did not meet the substance abuse criteria was randomly selected to serve as a control group. Women in these two groups were matched on year in school and Greek affiliation.

A third group was comprised of women who had received substance abuse assessments at Student Counseling Services within the last two years. All of the women in this sample who were eligible to participate had to have completed a substance abuse assessment and had to have a signed permission slip in their files indicating a willingness to participate in future

research for the counseling center. Based on these two criteria, the sample from the counseling center totaled 19 women.

Procedure

In the initial mass testing survey, students supplied their name, gender, birth date, telephone number, and the last six digits of their social security number for identification purposes. The mass testing form stated that students might be contacted in the future and asked to participate in additional studies, but that this participation would be voluntary. Students were initially contacted via letter, informing them about the study and asking for their participation. All informed consent issues (perceived risks and benefits, time involved, confidentiality, etc.) were addressed in this letter. As an incentive for participation in the follow-up study, students were told that their names would be entered in a drawing to win a cash prize or gift certificate worth 50 dollars. Letters were mailed to 249 women: 115 in the abuse group, 115 in the control group, and 19 in the counseling center group. The letter to the women in the counseling center group was asking for participation in a follow-up survey for the counseling center's substance abuse program, rather than for participation in my doctoral research.

Students were contacted by phone a few days after receipt of the letter and were asked to indicate their willingness to participate. Participants were given the option of completing the survey via mail or electronic mail (e-mail). If neither of those options was feasible, participants were given the option to complete the survey over the phone. A fellow graduate student was used to contact participants about the survey, but I conducted all surveys over the phone. I was also the only one to have any contact with the sample of women from Student

Counseling Services, due to the confidential nature of their data. Participants were asked to complete and return the mail survey materials within one week of receiving them; email respondents were asked to return the survey within a few days. A self-addressed, stamped envelope was included in all mail surveys so that the participants did not incur any expense in completing the survey. Data were gathered over the last two and one half weeks of the 1999 spring semester.

A total of 230 women from the Time 1 mass testing were contacted for participation in the follow-up study. A number of individuals could not be reached or traced (N=19), while others declined participation (N=19). Some women were reached but never returned phone calls or e-mails (N=21). Of the 171 women remaining, 149 returned their surveys, resulting in an 87 percent completion rate. The final number of participants represents 65 percent of the initial sample. Participation was split between e-mail (N=87) and mail (N=61), with only one woman choosing to complete the survey over the phone. Of the 149 women, 70 (47%) were in the "abuse" group, and 79 (53%) were in the control group.

The third group of participants, women who had completed a substance abuse evaluation from the counseling center, had a very low participation rate. Only five of the 19 individuals agreed to participate, and only three of them returned their surveys. Some could not be traced (N=6), while others declined participation (N=8). It was decided that, due to the extremely small number recruited, this group would be dropped from the analyses.

Measures

Time 1 measures

The mass testing survey covered a range of topics, including social desirability, self-esteem, sexual behavior, and alcohol use. Only portions of the mass testing survey were used.

Alcohol use. A drinking questionnaire was contained within the mass testing survey. This questionnaire was designed by graduate students in a psychology research methodology course, and was intended to assess students for alcohol abuse, based on the DSM-IV criteria (APA, 1994). The two groups of study participants were selected based on responses to items on this questionnaire. (See Table 7 in the results section for a listing of these items, as well as the percentage of women who endorsed them at both Time 1 and Time 2). In addition to questions dealing with alcohol abuse, demographic items were used in the current study, including ethnicity, year in school, g.p.a., family income, Greek affiliation, hometown population, and age of first drink. Students were also asked to estimate how much money they had spent on alcohol over the past semester, the number of occasions that they had consumed alcohol in the past month, and the number of times they had engaged in binge drinking over the past two weeks.

Self-esteem. The measure used to assess self-esteem was the Rosenberg Self-Esteem Scale (Rosenberg, 1965), a ten-item scale. Students indicated their agreement with each statement on a seven-point Likert scale (1-7, strongly disagree-strongly agree). Five of the ten items address high self-esteem and the other five reflect low self-esteem, to reduce possible response bias. Scores can range from 10-70, with higher scores indicating high self-

esteem. Internal consistency of this measure is quite high for this sample, with an alpha of .84.

Time 2 Measures

Demographic factors. Demographic factors assessed included year in school, living situation for Time 1 and Time 2, Greek affiliation at Time 1 and Time 2, ethnicity, and family history of alcohol abuse, because these variables have been shown to have an impact on drinking behavior (Lichtenfeld and Kayson, 1994; Klein, 1994; O'Hare, 1990; Perkins and Berkowitz, 1991; Thombs, 1991). Students were asked to allow access (via the Registrar) to their cumulative g.p.a. as well as their score on the ACT.

Alcohol use. The same alcohol questionnaire was used for the Time 2 survey, with some additions. Participants were asked to estimate the frequency with which they typically drink, as well as the average amount of alcohol they consume. There was also an opportunity for women to speculate about the reasons why their drinking may have changed over the last year (if it *had* changed). Finally, a section was added that asked respondents to estimate how many times in the last year certain events had happened. Examples from this list include the number of times they had enjoyed feeling “buzzed” or intoxicated, experienced “blackouts” (loss of memory) or “passouts” after drinking, driven drunk, and had unprotected sex with someone.

Self-esteem. The Rosenberg Self-Esteem Scale (Rosenberg, 1965) was administered again in the Time 2 questionnaire. Internal consistency was again high, with a coefficient alpha of .88.

Depression. Measures of self-esteem and depression were included because the research has indicated that self-esteem and mood--particularly depression--influence women's

drinking to a much larger extent than they do men's drinking (Kendler et al., 1993; Nunes, Quitkin, & Berman, 1988; Walitzer and Sher, 1996). Although depression was not assessed in the mass testing survey, it was evaluated in the Time 2 questionnaire. The Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) was used in the follow-up survey. The CES-D is a 20-item scale that was designed to measure depressive symptomatology in the general population. Respondents are asked to estimate the frequency with which they experienced certain symptoms over the past week. Responses may range from a score of zero (rarely or none of the time) to three (most or all of the time). The higher the respondent's score, the more symptoms of depression they are experiencing. A reliability analysis of internal consistency yielded an alpha of .88.

Social relationships. Three sections of questions were added to the Time 2 questionnaire, both to incorporate more positive aspects of the participants' lives, but also to get some sense of their level of social support. A shortened provision of the Social Provisions Scale (Cutrona and Russell, 1987) was used to assess perceived support from friends, parents and significant others. Specific items can be found in the Time 2 survey in Appendix B. Internal consistencies were quite good, ranging from .76 for the four friend items to .87 for the partner/significant other items. It should be noted that the higher alpha for the partner items is likely due to the fact that only 88 of the 149 women reported being in a relationship with a significant other for the Time 2 survey. In addition, when responding to items on the friend subscale, participants were asked to average their responses across several friends, not just one specific person.

Factor analyses

A principal components analysis was conducted to reduce the 13 alcohol abuse variables into a smaller number of factors. Three abuse items were removed from the factor analysis due to very low endorsements. These items were 1) suspension or expulsion from school, 2) neglect of children, and 3) operating machinery while intoxicated. Four factors were extracted based on eigenvalues greater than one. However, the fourth factor barely met that criterion and only had one variable that loaded on it. Therefore, the number of factors was reduced to three. A fourth item, arrest for alcohol-related disorderly conduct, did not load on any of the three factors. The structure matrix can be seen in Table 3. Factor scores were created by averaging the responses across items on each factor. These factor scores were used in later regression analyses.

Table 3. Structure matrix for alcohol abuse items (Time 2).

Variables	Factor 1: Interpersonal problems	Factor 2: Dangerous or irresponsible behaviors	Factor 3: Keeping up with personal responsibilities
Drinking has led to missed work or class	.46	.11	-.70
Drinking has led to decreased performance at work or school	.39	.11	-.74
Drinking has led to frequent neglect of household duties	-.20	.25	-.66
Drinking and driving within the last 12 months	.15	.80	-.25
Alcohol has been consumed in situations that may have been dangerous to self or others	.07	.85	-.09
Arrest for other things that were a direct result of alcohol use	.01	.54	.31
Gotten into physical fights after drinking	.80	.02	-.05
Drinking has caused problems in getting along with others	.84	.03	-.42
Drinking has caused trouble with family, friends	.80	.17	-.05

Note: rotation method was oblimin with Kaiser normalization.

A factor analysis was also conducted on the items dealing with motivations for drinking. These items included enjoying feeling “buzzed” or “drunk,” feeling more comfortable in social situations, having more fun at parties by drinking, and feeling either less depressed or anxious after drinking. The analysis revealed that these items only comprised one factor, not more than one, so they were summed to create a composite score.

Formation of summary scores

An alcohol abuse composite score was computed for each participant for each wave of data. This composite score was the sum of all positively answered items that assess DSM-IV criteria. A difference score was also computed from the Time 1 (spring 1998) and Time 2 (spring 1999) alcohol abuse composite scores so that changes in abusive drinking behaviors could be investigated. The Time 1 alcohol abuse composite score was subtracted from the Time 2 alcohol abuse composite score to reflect this change. For example, if a student answered “yes” to seven alcohol abuse questions for Time 1, but only answered “yes” to three questions at Time 2, her difference score would be -4 . This would reflect a reduction in alcohol abuse behaviors over the past year.

A second composite score was computed from Time 2 data that assessed negative consequences related to drinking. Items included such problems as unprotected sex, missed classes, feeling more depressed or anxious after drinking, getting into fights or disagreements with friends or significant others, legal problems, etc. Participants responded to these items based on how many times in the last year they had experienced these particular problems. All items that were endorsed by each participant were summed to represent that participant’s negative consequences composite score.

Another composite score was created to reflect each participant's motivation for drinking. Each woman estimated how many times in the last year she enjoyed feeling "buzzed" or "drunk," had more fun at a party or felt more comfortable socially after drinking, and felt either less depressed or less anxious after drinking. Responses were summed to create a composite motivation score.

Next, a composite score was created to obtain an estimate of each woman's average alcohol consumption over the course of one month. Each participant answered questions regarding 1) the number of times she drank each week, on average and 2) the typical amount of alcohol she consumed when she drank. Answers were given in ranges, so these responses were converted to the average number in each range. For example, if a participant chose the response "3 to 4 times per week" on the frequency item, she was given a score of 3.5. Then these two responses were multiplied together to get a figure that represented the amount of alcohol imbibed in any given week. Finally, this amount was multiplied by four to obtain an estimate of total monthly consumption.

Summary scores were computed for each measure of self-esteem (Time 1 and Time 2) and depression (Time 2 only). Summary scores were also computed for the three four-item measures assessing social support from one's friends, parents, and partner (if applicable). All of these summary scores were created by taking the average response across items for each of these scales. Finally, these three support scores were averaged to form a support summary score that would be used in later regression analyses.

RESULTS AND DISCUSSION

Descriptive statistics

Distributions of all variables used in the analyses were examined to make sure that all of them were in the expected ranges. Means and standard deviations were computed for each of the two groups for both waves of data. Time 1 means and standard deviations for all continuous variables may be found in Table 4, and Time 2 descriptive statistics may be found in Table 5. Table 6 contains information on all categorical variables across both waves.

Table 4. Means and standard deviations for Time 1 variables.

<u>Variables</u>	<u>Abuse</u>		<u>Nonabuse</u>	
	<u>Mean</u>	<u>Std. Dev.</u>	<u>Mean</u>	<u>Std. Dev.</u>
Grade point avg.	2.82	.64	2.88	.58
Population of home town	23.45	20.64	24.18	20.11
Family income	56.76	19.58	55.07	20.23
Dollars spent on alcohol in Fall '97	71.99	58.67	39.94	31.48
Age of first drink	14.31	3.01	12.79	6.09
# of binges in last two weeks	2.09	1.84	.92	1.43
# of drinking occasions in past month	6.03	4.34	2.12	2.65
Self-esteem summary score	5.17	1.06	5.52	1.03
Total # of abuse symptoms	2.03	1.61	0.00	0.00

Note: N=149. Numbers for both population of home town and family income should be multiplied by 1,000.

Not surprisingly, the majority of the sample (N=141) was Caucasian. Five women (3.4%) identified themselves as African-American; one was of Southeast Asian descent; and one woman self-identified as Pacific Islander. There was one female who identified herself as "other." With regards to hometown population, approximately the same number of women came from very small towns (N=41; 27.5%) as came from primarily urban areas

Table 5. Means and standard deviations for all Time 2 variables.

Variables	Abuse		Nonabuse		T-test results
	Mean	SD	Mean	SD	t
Grade point average	2.81	.53	2.96	.56	-1.67
ACT score	24.02	3.63	25.16	3.72	-1.73
# of binges in last two weeks	2.03	1.48	1.19	1.60	3.39**
# of drinking occasions in past month	7.16	5.84	3.44	3.79	4.72**
Average frequency * average amount	32.51	31.65	15.36	20.36	3.93**
Number of times in the last year...					
went to hospital/overdosed	.01	.12	0.00	0.00	1.00
enjoyed feeling "buzzed"	44.59	50.51	15.19	24.82	4.39**
threw up after drinking	2.99	3.13	1.22	2.36	3.87**
had memory "blackouts"	6.33	10.04	2.02	6.40	3.07**
"passed out" after drinking	11.49	22.40	1.78	5.97	3.52**
enjoyed feeling "drunk"	34.12	51.19	8.42	15.11	4.02**
felt more comfortable socially	31.87	43.63	6.91	11.87	4.64**
got into disagreements/fights	2.90	6.14	.71	2.25	2.82**
drove drunk	5.86	11.10	.93	5.73	3.34**
felt less anxious after drinking	19.19	33.73	4.47	11.16	3.46**
felt less depressed after drinking	11.17	21.68	2.67	8.81	3.05**
felt more depressed or anxious	7.51	19.70	1.28	5.80	2.53*
had drinking-related legal problems	.26	.77	.08	.47	1.70
missed class	4.13	7.75	.85	2.43	3.40**
had more fun at a party by drinking	28.01	37.00	8.24	16.05	4.14**
had unprotected sex	1.17	6.21	.04	.25	1.53
were raped or had unwanted sex	.06	.23	.03	.16	.96
Negative consequences composite score	42.02	54.64	8.92	25.42	4.59**
Motivations for drinking	167.40	212.91	45.91	74.51	4.53**
Total number of abuse symptoms	1.49	1.50	.43	.92	5.10**
Change in abuse symptoms over time	-.54	1.92	.44	.92	-3.89**
Number of close friends	6.93	4.25	6.82	4.30	.15
Number of casual friends	41.62	43.60	36.22	30.02	.88
Support from significant others	3.65	.38	3.72	.34	-1.11
Self-esteem	5.67	1.07	5.90	.77	-1.48
CESD	1.70	.45	1.56	.40	2.10*

Note: N=70 for abuse group, N=79 for nonabuse group; *=p<.05, **=p<.01; some items had unequal variances.

(N=42; 28.2%). The remainder of the sample (43.6%) fell in the middle, living in towns ranging in size from 2,501 to 50,000.

Most women in the sample (85.9%) at Time 1 were either freshmen (N=99) or sophomores (N=29). At Time 1, 38 women (25.5%) belonged to a sorority. By Time 2, that number changed to 34 women (22.8%) with Greek affiliation. Grade point averages

Table 6. Distributions of all categorical variables, as measured at Time 2.

Variable	Abuse	%	Nonabuse	%	χ^2
Year in school					3.70
Freshman	5	7.1	2	2.5	
Sophomore	45	64.3	50	63.3	
Junior	11	15.7	17	21.5	
Senior	8	11.4	7	8.9	
Graduate or Other	1	1.4	3	3.8	
Living Situation					12.32*
Residence halls	16	22.9	33	41.8	
Sorority	11	15.7	14	17.7	
Off-campus in an apartment or rental house	37	52.9	27	34.2	
Off-campus with family, Commuter, or Other	6	8.6	5	6.3	
Ethnicity					4.45
Caucasian	68	97.1	73	92.4	
All others	2	2.9	6	7.6	
Sorority affiliation					.16
Yes	17	24.3	17	21.5	
No	53	75.7	62	78.5	
Family history of alcohol problems					2.77
Yes	37	52.9	31	39.2	
No	33	47.1	48	60.8	
Ever received an alcohol evaluation at SCS					4.25*
Yes	6	8.6	1	1.3	
No	59	84.3	70	88.6	

Note: Chi square statistic reported is Pearson; *= $p < .05$.

(g.p.a.) across the two times were quite similar. A minority of the sample (16.1%) had lower than a 2.5 g.p.a. at Time 1. Most of the sample (59.7%) had a 3.0 g.p.a. or higher at Time 1. At Time 2, only a few women (12.7%) had below a 2.5 grade point average. Over one-half (56.4%) had at least a 3.0 g.p.a. at Time 2.

T-test analyses

A series of independent samples t-tests was conducted to determine whether the two groups differed significantly on any of the demographic variables. Results may be found in Table 5. Means were not found to be significantly different with regards to population of home town, family income, age of first drink, cumulative g.p.a., number of close friends, or number of casual friends. Mean ACT scores approached significance ($p < .10$). The control group had a slightly higher average ACT score than the abuse group.

A chi-square test of association was conducted on all categorical variables to determine whether the two groups differed significantly with regards to year in school, ethnicity, current living arrangement, sorority affiliation, family history, and whether women received substance abuse evaluations at SCS. Results may be seen in Table 6. The majority of the categorical demographic variables were not significantly related to abuse status. There were two significant differences, however, with regards to living arrangement ($p < .05$) and receiving a substance abuse evaluation at SCS ($p < .05$). More women in the nonabuse group lived in the residence halls, and more women in the abuse group lived off campus. Also, more women in the abuse group received alcohol evaluations at SCS. However, the overall lack of significant differences between the two groups on these variables suggests that they were quite similar demographically.

Reported drinking behavior

Students answered questions about the age they first started drinking, as well as current drinking behavior in the Time 1 mass testing survey. Table 7 shows the distribution of alcohol consumption patterns at both Time 1 and Time 2. About one-third (31.5%) of women had their first drink between the ages of 11 and 15 years, while most (43.6%) drank

Table 7. Distribution of Time 1 and Time 2 drinking patterns.

Variables	Time 1 Percent	Time 2 Percent
Age of first drink		
Never	8.7	N/A
10 years or younger	11.4	N/A
11-15 years	31.5	N/A
16-18 years	43.6	N/A
19 years or older	4.0	N/A
Number of binge drinking occasions in last two weeks:		
Never	43.0	36.9
One to two times	33.6	36.9
Three to four times	16.1	21.5
Five to six times	4.7	4.0
More than six times	2.0	0.7
Number of times consumed alcohol in past month:		
None	22.8	16.8
One to two occasions	23.5	22.1
Three to five occasions	26.8	22.8
Six to nine occasions	17.4	26.2
Ten to nineteen occasions	8.1	10.7
Twenty to thirty-nine occasions	0.0	1.3
Forty or more occasions	0.0	0.0
Change in drinking amount over last year		
Still don't drink	N/A	16.8
Drink a lot less now	N/A	13.4
Drink slightly less now	N/A	15.4
Drink about the same	N/A	31.5
Drink slightly more now	N/A	17.4
Drink a lot more now	N/A	5.4
Average amount consumed		
None	N/A	16.8
One to two drinks	N/A	18.8
Three to five drinks	N/A	47.0
Six to eight drinks	N/A	14.8
Nine or more drinks	N/A	2.7

Note: N=149

for the first time between ages 16 and 18. Less than ten percent (8.7%) had never drunk at all. Women were asked how many times they had engaged in binge drinking over the last two weeks. Surprisingly, most (43%) had not had more than four drinks in any one drinking occasion at Time 1. For those who did engage in binge drinking, the majority fell between one or two times (33.6%) and three to four times (16.1%).

Women were asked similar questions at Time 2, as well as whether there was someone in their family who had problems with alcohol (see Table 7). Just under half of the women in the survey (45.6%) reported a family history of alcohol problems. When asked about binge drinking over the past two weeks, 37 percent of the Time 2 sample reported no binge drinking. The same percentage of women (36.9%) reported only bingeing once or twice in the last two weeks, while a smaller percentage (21.5%) reported binge drinking on three to four occasions. With regards to the number of drinking occasions per month, most women reported drinking one to two times per month (22.1%), three to five times per month (22.8%), or six to nine times per month (26.2%).

Participants were asked to describe how their drinking had changed, if any, in the last year (see Table 7). Responses were divided among drinking less often (28.8%), drinking as often now as they had last year (31.5%), and drinking more often (22.8%). A fairly substantial percentage of the Time 2 sample (16.8%) reported not drinking at all. Of the drinkers, most (47%) reported consuming an average of three to five drinks per occasion.

Table 8 lists the percentage of respondents who answered each of the alcohol abuse questions affirmatively at Time 1 and Time 2. Those who met abuse criteria at Time 1 showed an overall decline over time in number of abuse symptoms. Also, while those in the

Table 8. Percentage of women reporting symptoms of alcohol abuse at Time 1 and Time 2.

Item	T 1 Percent		T 2 Percent	
	<u>Abuse</u>	<u>Nonabuse</u>	<u>Abuse</u>	<u>Nonabuse</u>
Drinking has repeatedly led to missed work or class	18.6	0.0	12.9	3.8
Drinking has frequently led to decreased performance at work or school	11.4	0.0	8.6	1.3
Drinking has led to school suspension or expulsion	2.9	0.0	0.0	0.0
Drinking has led to frequent neglect of one's children	1.4	0.0	0.0	0.0
Drinking has led to frequent neglect of household duties	12.9	0.0	11.4	5.1
Drinking and driving within the last 12 months	62.9	0.0	55.7	14.1
Drinking while operating machinery within the last 12 months	1.4	0.0	1.4	0.0
Alcohol has been consumed in situations that may have been dangerous to self or others	52.9	0.0	40.0	9.0
Arrest for alcohol-related disorderly conduct	4.3	0.0	1.4	2.6
Arrest for other things that were a direct result of alcohol use	5.7	0.0	2.9	0.0
Gotten into physical fights after drinking	2.9	0.0	1.4	1.3
Drinking has frequently led to problems in getting along with others	14.3	0.0	5.7	2.6
Drinking has frequently led to problems with family or friends	21.4	0.0	7.1	3.8

Note: N=149; Abuse group N=70, Nonabuse group N=79. Time 1 nonabuse group was selected because they had no abuse symptoms at Time 1.

nonabuse group endorsed no alcohol abuse symptoms at Time 1, some women in the nonabuse group showed some alcohol abuse symptomatology at Time 2.

Correlational analyses

Correlations among study variables were computed and may be found in Tables 9 and 10 and Appendix C. Table 9 contains correlations among abuse symptoms and demographic variables. Family history of alcohol abuse was significantly negatively associated with grade point average. ACT score was significantly negatively related to the number of abuse symptoms at Time 1. In addition, sorority affiliation was positively associated with both the number of casual friends and the number of close friends. As

expected, grade point average and ACT scores were significantly positively correlated with each other. Lastly, the number of abuse symptoms showed fairly high stability over time.

Table 10 contains correlations among alcohol consumption, self-esteem, support, and depression. Both Time 1 and Time 2 alcohol abuse symptoms were significantly positively

Table 9. Correlations among abuse symptoms and demographic variables.

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. GPA	1.00										
2. ACT score	.45**	1.00									
3. Greek affiliation	.07	-.04	1.00								
4. # of close friends	-.01	-.00	.20*	1.00							
5. # of casual friends	.07	.12	.32**	.49**	1.00						
6. Home town population	-.08	-.00	.00	-.17*	-.03	1.00					
7. Family income	.12	.28**	.07	.00	.12	.18*	1.00				
8. Age of first drink	-.02	-.06	.24**	.00	.08	.11	.06	1.00			
9. Family history of alcohol problems	-.17*	-.14	.08	.07	.07	-.03	-.12	-.09	1.00		
10. Evaluation ever at SCS	.04	-.01	-.03	-.11	-.25**	-.04	-.01	-.04	-.05	1.00	
11. # of abuse symptoms (T1)	-.12	-.23**	.06	.06	.01	-.04	-.01	.11	.13	-.23**	1.00
12. # of abuse symptoms (T2)	-.08	-.01	.03	.04	.14	-.06	.04	.00	.11	-.12	.40**

Note: * = $p < .05$; ** = $p < .01$.

associated with depression at Time 2. Time 1 and Time 2 alcohol abuse symptoms were also significantly positively correlated with motivations for drinking, average monthly consumption, and negative consequences related to drinking. Self-esteem demonstrated

moderately high stability over time, and was significantly positively related to social support over both waves of data.

Table 10. Correlations among alcohol consumption, self-esteem, support, and depression.

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. # of abuse symptoms at T1	1.00								
2. # of abuse symptoms at T2	.40**	1.00							
3. Negative consequences (T2)	.44**	.59**	1.00						
4. Motivations for drinking (T2)	.32**	.51**	.76**	1.00					
5. Average monthly consumption (T2)	.30**	.53**	.62**	.66**	1.00				
6. Change in # of abuse symptoms	-.62**	.47**	.07	.13	.17*	1.00			
7. self-esteem for T1	-.18*	-.07	-.13	-.13	-.04	.11	1.00		
8. self-esteem for T2	-.10	-.11	-.29**	-.12	.01	.00	.52**	1.00	
9. Support (T2)	-.10	.02	-.16	-.07	.10	.11	.31**	.49**	1.00
10. CES-D (T2)	.21**	.24**	.36**	.17*	.02	.00	-.41**	-.67**	-.46**

Note: * = $p < .05$; ** = $p < .01$.

Appendix C contains correlations among all alcohol-related variables across both waves of data. Both the reported number of binges over the last two weeks and the number of drinking occasions in the last month had at least moderate stability over time. Binge drinking at Time 2 was significantly positively associated with throwing up after drinking, having blackouts, passing out after drinking, getting into fights, driving drunk, legal trouble, missing class, and getting raped. Family history of alcohol problems was significantly positively correlated with feeling more comfortable socially by drinking.

Tests of hypotheses

Comparison between groups

The first hypothesis to be tested was that women who met the alcohol abuse criteria at Time 1 would drink more (in terms of frequency and/or amount) at Time 2 than the control group. An independent samples t-test was conducted to determine if mean Time 2 alcohol consumption differed significantly between the two groups. Table 5 displays the results of these analyses. Results indicated that the abuse group and the control group differed significantly on a number of alcohol use questions—all in the expected direction. On the measure of average monthly consumption, both in terms of frequency and amount, the two means were significantly different at the .001 level.

A repeated measures ANOVA was conducted for those alcohol items for which there were two data points (T1 and T2): number of binges in the past two weeks, number of drinking occasions in the past month, and number of alcohol abuse symptoms endorsed. In the case of the number of binge drinking episodes in the last two weeks, neither the effect of time, $F(1, 146) < 1$ nor the interaction effect, $F(1, 146) = 1.18$, $MSE = 1.67$ were significant. The between-subjects effect was highly significant, $F(1, 146) = 21.97$, $MSE = 3.40$, $p < .001$. When looking at the number of drinking occasions over the last month, the effect of time was significant, $F(1, 146) = 9.84$, $p < .01$, but the interaction was not $F(1, 146) < 1$, $MSE = 11.32$. In other words, the number of drinking episodes per month went down from Time 1 to Time 2, but the number of binges stayed the same. The between-subjects effect for number of drinking occasions in the last month was also significant, $F(1, 146) = 42.92$, $MSE = 25.01$, $p < .001$.

The two groups also differed significantly on the number of abuse symptoms endorsed at Time 2 ($p < .01$), with women in the abuse group endorsing an average of 1.49 abuse items, and women in the control group endorsing 0.43 abuse items, on average. The effect of time was not significant, $F(1, 146) < 1$, but the interaction effect was significant, $F(1, 146) = 16.20$, $MSE = 1.09$, $p < .001$. This is likely because there was also a significant difference ($p < .001$) between the two groups on the difference score created to reflect change in the number of abuse symptoms over time. The abuse group actually showed a slight decrease in alcohol abuse symptoms, while the nonabuse group showed a slight increase in number of abuse symptoms. The between-subjects effect for number of abuse symptoms was highly significant, $F(1, 146) = 106.64$, $MSE = 1.64$, $p < .001$.

Interestingly, women in the abuse group appeared to both enjoy drinking and obtain more social and personal benefits from drinking than women in the control group. T-tests conducted on items concerning possible motives for drinking were significantly different between the two groups. Means in the abuse group were significantly higher for “enjoyed feeling buzzed” ($p < .001$), “enjoyed feeling drunk” ($p < .001$), “felt more comfortable socially” ($p < .001$), “felt less anxious after drinking” ($p < .01$), “felt less depressed after drinking” ($p < .01$), and “had more fun at a party by drinking” ($p < .001$).

The second hypothesis to be tested was that women who met the criteria for alcohol abuse at Time 1 would report more problems related to their drinking at Time 2 than the control group. Again, an independent samples t-test was conducted to determine if there was a significant difference between the two means. These results are shown in Table 4. The two groups differed significantly on the total number of drinking-related negative consequences ($p < .001$). Specific items on which the two groups substantially differed included throwing

up after drinking ($p < .001$), having blackouts ($p < .01$) and passouts ($p < .01$), getting into disagreements or fights ($p < .01$), driving drunk ($p < .01$), feeling more depressed or anxious after drinking ($p < .05$), and missing class ($p < .01$). Mean differences in legal trouble related to drinking approached significance ($p < .10$). Two negative consequences did not show any significant differences between the two groups: having unprotected sex and being raped.

A third hypothesis concerned the drinking behavior of women based on their college living arrangement. Specifically, I predicted that sorority women would drink more than any other women, and women who lived independently off-campus would drink more than women who lived on-campus. This hypothesis was tested by using an independent samples t-test. Women who were affiliated with a sorority ($N=34$) consumed an average of 30.26 drinks per month, whereas women who were not in the Greek system ($N=115$) consumed an average of 21.26 drinks per month. However, this difference did not attain statistical significance.

Next, a one-way ANOVA was conducted to examine alcohol consumption by living arrangement. Three of the groups (off-campus/with family, commuter, and other) were removed from the analyses because too few women fell into these categories. The ANOVA revealed a between-groups difference that approached significance ($p < .10$). Specifically, there was a slight indication that women who lived off-campus in an apartment or rental house drank more than women who lived in the residence halls ($p < .10$). No significant differences were found between women who resided in sorority housing and either of the other two groups.

Although most differences did not achieve significance, it is of interest to consider the alcohol consumption of women in different living situations. Women who lived off-campus

in a rental unit reported the largest average monthly consumption (28.95 drinks per month), followed closely by women who resided in a sorority house (26.72 drinks per month). Women who resided in the residence halls reported a much lower average monthly consumption (17.12 drinks per month). The maximum consumption amounts were also highest for women who were renting off-campus (126 drinks per month), followed by women who lived in either a sorority or a residence hall (98 drinks per month).

Multiple regression analyses

To examine which factors predicted alcohol abuse and its related negative consequences, I conducted a series of multiple regression analyses. Whenever current living situation was used in the prediction of these dependent variables, it should be noted that only three of the original six living options were used: residence hall, off-campus apartment, and sorority house. The other three living situations were eliminated due to small numbers. Dummy variables were created to represent living in a residence hall and living in an off-campus apartment or rental unit. The omitted group, living in a sorority, was the contrast for the two dummy-coded variables. (It should also be noted that these regression analyses were all run a second time without sorority affiliation as a predictor variable, to control for any multicollinearity issues. None of the regression results were changed in the sense of significant change in R^2 , Beta weights, nor significance level.) In the first analysis, the number of alcohol abuse symptoms at Time 1 was the dependent variable. Predictors included living in a residence hall, living in an off-campus apartment, sorority affiliation, g.p.a., and self-esteem—all at Time 1. The resulting regression yielded very low explanatory power ($R^2=.06$), with no significant predictor variables. Only one predictor variable, Time 1 self-esteem, approached significance (Beta = -.14, $p<.10$).

The second multiple regression analysis was conducted to determine which variables predicted Time 2 alcohol abuse symptoms controlling for Time 1 alcohol abuse symptoms. Table 11 displays the results of this regression analysis. Predictor variables included Time 2 living arrangement (residence hall and off-campus apartment), Time 2 sorority affiliation, family history of alcohol abuse, support from significant others, depression at Time 2, self-esteem at Time 1, g.p.a. at Time 1, whether they had ever received a substance abuse evaluation at SCS, and motives for drinking. There were significant main effects for Time 1 abuse symptoms ($p < .001$) and the CES-D depression score ($p < .01$). Therefore, the greater the number of abuse symptoms at Time 1 and the more depressed a woman was, the more

Table 11. Multiple regression predicting number of abuse symptoms at Time 2.

Predictor	Change in R^2	F (R^2)	Final Stdized. Beta	T (Beta)
1. Number of abuse symptoms at T1	.17	26.75**	.24	3.13**
2. Self-esteem (T1)	.26	5.71**	.06	<1
Time 1 g.p.a.			.08	1.10
Living in residence hall (T2)			.12	1.04
Living in an apt. or rental house (T2)			.10	<1
Greek affiliation (T2)			-.01	<1
Support from significant others (T2)			.14	1.71
CES-D (T2)			.25	2.88**
Family history of alcohol problems			.03	<1
Ever received an alcohol evaluation at SCS			-.02	<1
Motives for drinking (T2)			.46	6.15**

Note: N=149; * = $p < .05$, ** = $p < .01$.

likely she was to endorse abuse symptoms at Time 2. In addition, there was a significant main effect for motives for drinking ($p < .001$). In other words, women who enjoyed feeling drunk or who experienced social lubrication from drinking were more likely to abuse alcohol. Support from significant others approached significance ($p < .10$).

A third multiple regression analysis was conducted to determine the contributions of Time 1 abuse symptoms, demographic factors, and social and emotional factors in predicting the number of negative consequences from drinking reported at Time 2. The number of abuse symptoms at Time 1 was entered first, followed by Time 2 living arrangements, Time 2 sorority affiliation, Time 1 self-esteem, the CES-D depression score, support from significant others, family history of alcohol problems, Time 1 g.p.a., whether they had received a substance abuse evaluation at SCS, and motives for drinking. Table 12 shows the results of this regression analysis. There was a significant main effect once again for Time 1 abuse symptoms ($p < .001$). There was also a significant main effect for the CES-D score ($p < .001$) as well as motives for drinking ($p < .001$). Thus, the more abuse symptoms at Time 1, the greater the number of negative consequences experienced at Time 2. In addition, level of depression and motives for drinking were both positively predictive of negative consequences related to drinking.

Table 12. Multiple regression predicting number of negative consequences at Time 2.

Predictor	Change in R^2	F (R^2)	Final Stdized. Beta	T (Beta)
1. Number of abuse symptoms at T1	.21	33.78**	.21	3.62**
2. Self-esteem (T1)	.48	18.43**	.06	1.09
Time 1 g.p.a.			.05	<1
Living in residence hall (T2)			.01	<1
Living in an apt. or rental house (T2)			.01	<1
Greek affiliation (T2)			.07	<1
CES-D (T2)			.27	4.22**
Support from significant others (T2)			.14	<1
Family history of alcohol problems			.04	<1
Ever received an alcohol evaluation at SCS			.05	<1
Motives for drinking			.65	11.59**

Note: N=149; * = $p < .05$, ** = $p < .01$.

Three more multiple regression analyses were conducted to predict specific types of alcohol abuse factors: interpersonal problems, dangerous or irresponsible behaviors, and keeping up with personal duties. For the first analysis, the dependent variable was interpersonal problems at Time 2. The first predictor variable entered was Time 1 interpersonal problems, followed by Time 2 living arrangement, Time 2 sorority affiliation, Time 1 self-esteem, depression (Time 2), support from significant others, family history of alcohol problems, and motives for drinking. Results yielded no significant predictor variables—not even marginally significant predictors.

In the second regression analysis, Time 2 dangerous or irresponsible behaviors was the dependent variable. Predictor variables included dangerous or irresponsible behaviors at Time 1, followed by the same demographic and personal factors used in all previous analyses. The only variables that were significant were Time 1 dangerous or irresponsible behaviors (Beta=.27, $p<.001$) and motives for drinking (Beta=.38, $p<.001$).

In the third regression analysis, Time 2 keeping up with personal duties was the dependent variable. Time 1 keeping up with personal duties was entered first, followed by the same set of predictors listed above. Table 13 shows the results of this regression analysis. There was a significant positive main effect for keeping up with personal duties at Time 1 ($p<.0001$). There were also significant main effects for support from significant others ($p<.01$), the CES-D score ($p<.001$), motives for drinking ($p<.001$), and whether they had ever received a substance abuse evaluation at SCS ($p<.01$). Family history of alcohol problems approached significance ($p<.10$). In other words, women were more likely to keep up with their personal obligations if they were doing so at Time 1. They were also less likely

Table 13. Multiple regression predicting keeping up with personal duties at Time 2.

Predictor	Change in R ²	F (R ²)	Final Stdized. Beta	T (Beta)
1. Keeping up with personal duties (T1)	.12	18.62**	.32	4.33**
2. Self-esteem (T1)	.27	6.02**	.05	<1
Living in residence hall (T2)			-.03	<1
Living in an apt. or rental house (T2)			-.00	<1
Greek affiliation (T2)			-.01	<1
CES-D (T2)			.41	4.79**
Support from significant others (T2)			.26	3.09**
Family history of alcohol problems			-.14	-1.86
Ever received an alcohol evaluation at SCS			.20	2.73**
Motives for drinking (T2)			.30	3.98**

Note: N=149; * = $p < .05$, ** = $p < .01$.

to neglect personal duties if they had social support, were more depressed, were motivated to drink, and had ever received a substance abuse evaluation at SCS.

Discussion

The first hypothesis was that women who met the criteria for alcohol abuse at Time 1 would consume more alcohol at Time 2 than would the women in the control group. This hypothesis was strongly supported. Not only did the women in the abuse group drink more (in terms of frequency and amount) at Time 2 than their nonabuse counterparts, but women in the abuse group also engaged in binge drinking on a more frequent basis.

In addition, the two groups differed significantly on motives behind using alcohol, such as enjoying the effects of alcohol, relieving anxious or depressive symptoms, and feeling more comfortable socially. These items point to a pattern of using alcohol as either a social lubricant or a form of self-medication. This confirms findings by several researchers, including Walitzer and Sher (1996) and Wilsnack (1973), who asserted that women are more

likely to drink in response to personal stressors. Perhaps those women who are more likely to abuse alcohol do so, in part, because they lack the requisite coping skills for dealing with such stressors. The nonabuse group certainly showed some signs of using alcohol as a social lubricant, but not nearly to the extent that the abuse group did. One way to change the amount of drinking among women, then, might be to provide them with skills that help them cope with anxiety, depression and self-esteem issues.

The second hypothesis tested was that women who met the criteria for alcohol abuse at Time 1 would have more negative consequences related to their drinking at Time 2 than the women in the control group. This hypothesis was also strongly supported. Women who were identified as alcohol abusers at Time 1 were more likely to have had blackouts, passouts, driven drunk, to have thrown up after drinking, missed class, and gotten into disagreements or fights with others. There were four exceptions in which significant differences were not found: overdosing on alcohol, having drinking-related legal problems, being raped/having unwanted sex, and having unprotected sex with a casual partner. It is likely that differences were not found on these four consequences because very few women endorsed these items. A larger sample of women would likely include a larger number of individuals who had experienced these negative consequences.

The first portion of the third hypothesis, that women who were in a sorority would drink more than other women on campus, was not supported. It was hypothesized that, had the sample of sorority women been larger, the average amounts between the two groups would have been significantly different and would have mirrored results found by Thombs (1991) and Saltz and Elandt (1986). Or perhaps sororities at ISU differ from other universities in

their tolerance of alcohol use and abuse. Future studies on this campus may wish to recruit a larger sample of women with Greek affiliation and explore this phenomenon further.

The prediction that living situation would affect alcohol consumption received only partial support. The only difference that closely approached significance on alcohol consumption was between women in off-campus apartments and women who lived in the residence halls, which does support O'Hare's (1990) research. Once again, significant differences might have been found among the groups if the N were larger for the three groups. Unfortunately, commuters and women who lived with their family comprised too few women to compare their consumption levels to on-campus, sorority, and apartment residents.

Regression analyses were conducted to determine what predicted alcohol abuse at Time 1 and Time 2. Although no significant predictors of Time 1 abuse were found, significant main effects were found in the prediction of alcohol abuse at Time 2. Specifically, the greater the number of abuse symptoms at Time 1, the more abuse symptoms a woman had at Time 2. In addition, there was a significant main effect of depression such that the more depressed a woman was, the more likely she was to have engaged in alcohol abuse at Time 2. Lastly, women who enjoyed drinking in order to either feel differently or for its social lubrication were more likely to endorse abuse symptoms. This adds to the evidence that some women in this sample are using alcohol to alleviate depressive symptomatology and to "feel" differently in general.

Another regression analysis was conducted to determine the contributions of Time 1 abuse symptoms, demographic factors, and social and emotional factors in predicting the number of negative consequences at Time 2. There was a significant main effect for the

number of abuse symptoms at Time 1, but there were also significant main effects for both the CES-D score, which measures depressive symptomatology, and the woman's motivation for drinking. Thus, the more a woman was abusing alcohol at Time 1, the more negative consequences she had related to her drinking at Time 2. The same was true for women who reported feeling depressed or who were motivated to drink because they enjoyed feeling drunk or more comfortable socially; the more women used alcohol to serve these purposes, the more negative consequences they had related to their drinking. Again, this points to use of alcohol to self-medicate, and demonstrates that there are problems associated with that kind of drinking. alcohol-related problems.

The three alcohol abuse factors were investigated in a series of regression analyses to determine what predicted interpersonal problems, dangerous or irresponsible behavior, and keeping up with personal duties over time. Nothing was significantly predictive of interpersonal problems over time, including interpersonal problems at Time 1. The only variables that significantly predicted dangerous or irresponsible behavior at Time 2 were similar behavior at Time 1 and motives for drinking. However, there were significant predictors of keeping up with personal duties at Time 2. First, if a woman was keeping up with her personal obligations at Time 1, she was more likely to still be doing that at Time 2. Surprisingly, women who were more depressed were more likely to keep up with personal duties. There is no logical explanation as to why depression is predictive of keeping up with personal duties. It may be an anomaly in the data, and should be tested again in future studies. Other positive predictors were social support, having ever had a substance abuse evaluation at SCS, and motives for drinking. Again, there is no logical reason why women who enjoyed the mood-altering properties of alcohol were better at keeping up with their

obligations. This, too, may be an anomaly in the data and should be retested in subsequent studies. Women who felt more supported by friends and loved ones might have had a higher motivation to manage personal obligations—perhaps so that they had more time to spend with people in their support network. With regards to the predictive nature of having a substance abuse evaluation, perhaps such an evaluation led to an increased awareness of alcohol abuse and encouraged women not to neglect their classes, chores, etc. In addition, it should be noted that a majority of the women who had a substance abuse evaluation had a low number of abuse symptoms. Therefore, they may not drink enough for alcohol to interfere with personal and occupational functioning.

Use of self-report data

The use of self-report data to assess behaviors is often viewed as problematic. Researchers are frequently concerned that self-report data is biased and inaccurate. Several studies have addressed the use of self-report data in alcohol research. Johnson, Gerstein, and Rasinski (1998) reported a decrease in accuracy of reporting age of first use of alcohol when the time interval between first use and current age increased. In other words, the farther away one gets from an alcohol incident, the less accurate one is in reporting about the incident. Their study spanned thirteen years, however, whereas my study primarily focused on alcohol use over the past twelve months. Therefore, the results of my study are not likely to be affected by this phenomenon. Other researchers (Harris, Wilsnack, & Klassen, 1994; Grant et al., 1997) have found little distortion in reporting over time spans ranging from an average of 231 days to five years.

Bongers et al. (1999) looked at the validity of self-reported drinking by comparing spouses' reports of each other's drinking patterns. They found that, at moderate amounts,

self-report and other reports were not significantly different. However, at higher amounts, self-report data were lower than other report among women. This has particular relevance for my study in that women who are consuming larger than average quantities of alcohol may be underreporting their use.

Although most research tends to support the finding that drinkers do not underreport their alcohol consumption, it could easily be argued that college drinkers do underestimate the severity of their drinking patterns. For example, in both waves of data, several women admitted to driving while intoxicated. However, not all of these women endorsed using alcohol in situations in which it may have been dangerous to oneself or others. There appears to be a perception by this sample of women, and perhaps by the college population as a whole, that driving under the influence of alcohol is not putting oneself or others at risk. Other research (Engwall & Goldstein, 1990; Wechsler et al., 1994) has found similar responses in students who reported experiencing alcohol-related problems. According to a study of students at over 100 college campuses (Wechsler et al., 1994), frequent binge drinkers and/or those who experience negative consequences related to their drinking do not view themselves as problem drinkers. This obviously distorted perception is something that needs to be addressed in future intervention programming.

Changes in drinking patterns: open-ended data

Participants were given an opportunity to explain why their drinking had changed (if it had changed). For those who reported an increase in drinking, reasons often included turning 21, "hanging out" with a group of friends and/or a significant other that tended to drink more often, and having more income. Others noticed a decrease in authority figures' influence on their drinking, citing that parents were less concerned about them staying out late, and/or that

moving off-campus gave them fewer rules to follow regarding alcohol. A few listed more personal reasons, such as “it sometimes makes me less bored at parties” or drinking because of “stress from trying to decide what to do with a career, and my family nagging me.” So, it would appear that increases in drinking, at least for this sample, were related to increased availability, increased resources, decreased sanctions, and perhaps more social pressure to drink. A small number of students reported drinking to self-medicate (“school gets so stressful that sometimes you just need a drink to relax”), which mirrors the findings that some women in the study did appear to be drinking to alleviate feelings of anxiety and/or depression.

There were several reasons why women reported reductions in their drinking. An increase in workload and/or course difficulty was frequently cited, leading to a decrease in time available for drinking. This makes sense as most, if not all, of the women were dealing with the demands of more advanced courses by the time of the follow-up study. A second reason concerned peer influence. Several women reported that their friends and/or significant other did not drink, so they would often socialize together in ways that didn’t involve drinking. Thus, there is evidence that women’s peer groups can significantly influence their drinking, either facilitating or discouraging the ingestion of alcohol. These results are similar to results found by Wilsnack, Wilsnack, and Klassen (1984), who found that women’s drinking patterns were strongly related to how their family and/or significant other drank.

Several women reported a reduction in their drinking over the past year to be related to negative consequences they incurred from drinking. For example, one woman commented, “I got tired of being sick and hungover. Also, my grades suffered when I was drinking.”

Another women reported, “I wasn’t liking my actions when I consumed too much alcohol.” Others spoke of legal troubles (“I got an OWI last August and I have to be careful not to get in any more trouble”) or to health concerns (“I have gastrointestinal problems that do not allow me to drink alcohol anymore”). One woman mentioned a concern due to her family history: “My mom is an alcoholic and I thought that I was starting to drink too much so I rarely drink now.” Finally, several women spoke to the fact that drinking was simply no longer as much fun for them as it once was, or that they no longer felt the need to drink in order to have a “good time.” Most of the comments reflected an increased maturity and an ability to objectively look at one’s drinking behavior. Perhaps reduction comes with increased self-awareness.

Limitations of this study and areas for future research

This study has confirmed that women who were abusing alcohol one year ago still consume more, in terms of frequency and amount, than their nonabusing counterparts. It also confirmed that women who abuse alcohol have more negative consequences associated with their use. This study is limited in its generalizability, however. Because researchers (Johnston, O’Malley, & Bachman, 1991) have found that college students tend to drink more than their same-aged peers who are not attending college, these findings may only generalize to female college students. It should also be emphasized that one year is a brief follow-up period, and that these results may look different when stretched over a longer period of time.

Although these results did not find family history of alcohol problems to be predictive of alcohol abuse, this does not mean that previous research was erroneous. The women who participated in this study were primarily in their late teens and early twenties. It is quite possible that, because women tend to develop drinking problems at an older age (Lex, 1991;

Williams et al, 1987), family history may not predict problematic drinking patterns until much later in life. In addition, previous research conducted on college campuses (Engs, 1990; Havey & Dodd, 1993; Werner & Greene, 1992) found no differences in drinking patterns between those with a family history of alcohol problems and those with no family history. Rose (1998) asserts that genetic influences on drinking do not appear to affect the initiation of drinking, but, once initiated, seem to heavily influence both the frequency and quantity of alcohol ingested. In addition, family history only appears to be predictive of alcohol abuse after age 30 (Rose, 1998). Thus, while most college students appear to “outgrow” it, binge drinking still appears to create problems for students, and if it continues, it could be extremely problematic—especially among those with a family history of alcoholism. Future studies may wish to explore the long-term contribution of family history to problematic drinking behaviors.

Future studies may also wish to explore women’s rationale for changes in drinking even further, as women’s environments seem to influence their drinking patterns. Additional research could explore women’s family drinking patterns as well as the consumption levels of their significant others and peers. This study only touched briefly on family history of alcohol problems, not actual consumption levels among family members. It would also be interesting to follow a group of women from their college years through several years of marriage, to see how their drinking patterns change relative to their friends’ or partner’s drinking patterns.

It was disappointing that the sample of women from the counseling center was both too small and generally uncooperative about participating. Information from this group would have been very valuable, as it could potentially speak to the effect of intervention and

education on later drinking behavior. Alcohol intervention policies have only recently received attention regarding their effectiveness, and researchers have only begun determining what interventions work for which age groups, environments, etc. This information is extremely important if the goal is to reduce binge drinking and subsequent problematic behavior on college campuses. Existing intervention programs should turn their attention to evaluating the effect of their work on changes in the college drinking environment.

Concerns about students' drinking seem to be very prevalent at most college campuses. However, it also appears that some campuses are rather segmented in their study of this phenomenon. At least on this campus, the Student Health Center, Student Counseling Services, the Department of Public Safety, and the Psychology Department are all conducting evaluations and surveys on alcohol use and abuse. None of these studies is being conducted in quite the same way, which makes comparisons across samples very difficult.

Conclusion

So what information has been gleaned from this study? The main question I wanted to answer was this: Is heavy drinking during the early college years a relatively harmless phase, or does it lead to significant problems that may have longer-term consequences? Although this study was limited to problems that occurred over the course of one year, I believe that there is evidence to suggest that women who drink heavily in college may suffer more negative consequences than what might be expected for a "harmless phase." Women who abuse alcohol during their first year or two of college consistently report having physical problems related to drinking (throwing up, passing out, and having "blackouts"), having social and emotional problems (getting into disagreements or fights after drinking, feeling more depressed or anxious after drinking), and engaging in irresponsible activities (driving

drunk and missing class). These results suggest that females who abuse alcohol in college experience distress in a number of areas of their lives that can directly be linked to their alcohol use. Continued disruption of social, occupational, and physical functioning without abatement of alcohol consumption is usually indicative of alcohol dependence.

Interestingly, alcohol abuse among this group of women was not associated with a significant change in g.p.a. or level of self-esteem. In addition, alcohol abuse appears to be related to risky sexual behavior and legal problems in only a very small number of women. Thus, there is evidence to suggest that some of these women employ certain rules to regulate their drinking patterns. For example, it may be acceptable for some to miss class occasionally because of drinking, but if their g.p.a. starts to falter, their alcohol consumption may be temporarily cut back until their status as a student is improved. Women who are adhering to such rules are likely to be less problematic drinkers than those women who are primarily using alcohol to alleviate social and emotional discomfort, or than women who continue to drink heavily despite social, physical, and/or occupational consequences.

If this group of women were followed for several more years, I would expect to see two distinct phenomena occur. First, I would expect to see a continuation of the regression toward the mean. In other words, I would expect the abuse group, for the most part, to show a gradual decline in their abuse symptomatology. I would also expect some members in the nonabuse group to experiment more with alcohol and subsequently endorse a small number of abuse symptoms over time.

Secondly, I would expect that, while most of the women in the abuse group will eventually “grow out of” this drinking pattern, there will be a handful of women who will have learned to rely on alcohol for social lubrication and self-medication. It is also possible

that these women will learn to mentally separate their drinking patterns from any negative consequences they may have incurred. Once that connection is broken and denial is established, drinking may continue unchecked. For these women, identified early in their college careers as problem drinkers, heavy drinking will not be merely a “phase” but rather will become part of their lifestyle.

APPENDIX A: TIME 1 QUESTIONNAIRE

Self-Description

Below are several statements about how you feel about yourself. Please read each statement carefully. Indicate how much you agree with each statement by filling in the appropriate letter next to each item. Use any of the letters on this scale:

A	B	C	D	E	F	G
Strongly						Strongly
Disagree						Agree

- _____ 1. I feel that I'm a person of worth, at least on an equal level with (equal to) others.
- _____ 2. I feel that I have a number of good qualities.
- _____ 3. All in all, I'm inclined to feel that I'm a failure.
- _____ 4. I am able to do things as well as most other people.
- _____ 5. I feel I do not have much to be proud of.
- _____ 6. I take a positive attitude toward myself.
- _____ 7. On the whole, I am satisfied with myself.
- _____ 8. I wish I could have more respect for myself.
- _____ 9. I certainly feel useless at times.
- _____ 10. At times, I think I am no good at all.

Demographic Questions

- _____ 11. Indicate your year in school:

a) First year student	d) Senior
b) Sophomore	e) Graduate Student
c) Junior	f) Other
- _____ 12. Please indicate your current Grade Point Average:

a) 1.00-1.75	d) 2.76-3.25
b) 1.76-2.25	e) 3.26-4.00
c) 2.26-2.75	

- _____ 13. Please select the word that you feel best describes your ethnicity:
- a) African-American
 - b) Caucasian
 - c) Latino
 - d) Southeast Asian (China, Japan, Korea, Vietnam, etc.)
 - e) South Asian (India, Pakistan, Bangladesh, etc.)
 - f) Native American
 - g) Pacific Islander
 - h) Other
- _____ 14. Are you affiliated with a Greek fraternal organization?
- a) Yes
 - b) No
- _____ 15. Please select the approximate population of the city you lived in before coming to ISU:
- a) Under 2,500
 - b) 2,501-10,000
 - c) 10,001-25,000
 - d) 25,001-50,000
 - e) 50,001 and up
- _____ 16. Please select the dollar amount which best describes your family's income:
- a) Under \$20,000
 - b) \$20,001-\$40,000
 - c) \$40,001-\$60,000
 - d) \$60,001-\$80,000
 - e) \$80,001 and up

Drinking survey

Please use these two response choices for the next section:

- a. yes**
- b. no**

- _____ 17. In the last 12 months, has your use of alcohol led you to repeatedly miss work or class?
- _____ 18. In the last 12 months, has your use of alcohol frequently adversely affected your schoolwork or performance at work?
- _____ 19. In the last 12 months, has your use of alcohol led to suspension or expulsion from school?

Please use these two response choices for the next section:

- a. yes**
- b. no**

- _____ 20. In the last 12 months, has your use of alcohol frequently led you to neglect your children? (Answer "no" if you don't have any children.)
- _____ 21. In the last 12 months, if applicable, has your use of alcohol led you to neglect household duties? (e.g., laundry, showering, etc.)
- _____ 22. In the last 12 months, have you been intoxicated while driving a motor vehicle?
- _____ 23. In the last 12 months, have you been intoxicated while operating machinery (e.g., lawnmower, tractor, chainsaw, etc.)
- _____ 24. In the last 12 months, have you used alcohol in situations in which it might have been physically dangerous to yourself or others?
- _____ 25. In the last 12 months, have you been arrested for alcohol-related disorderly conduct?
- _____ 26. In the last 12 months, have you been arrested for anything else that was a direct result of using alcohol?
- _____ 27. In the last 12 months, have you frequently gotten into physical fights while drinking alcohol?
- _____ 28. In the past 12 months, has drinking alcohol frequently caused you problems in getting along with other people?
- _____ 29. In the last 12 months, has drinking alcohol frequently caused trouble between you and a family member, spouse/significant other, or friend?
- _____ 30. At what age did you first have more than a sip of beer, wine, or liquor?
 - a) Never have
 - b) 10 years or younger
 - c) 11-15
 - d) 16-18
 - e) 19 years or older

- _____ 31. Think back over the last two weeks. If you are a male, how many times have you had five or more drinks in a single drinking episode? If you are a female, how many times have you had four or more drinks in a single drinking episode?
- a) Never
 - b) 1-2 times
 - c) 3-4 times
 - d) 5-6 times
 - e) more than 6 times
- _____ 32. On how many occasions have you had a drink of alcohol in the past 30 days?
- a) None
 - b) 1-2 occasions
 - c) 3-5 occasions
 - d) 6-9 occasions
 - e) 10-19 occasions
 - f) 20-39 occasions
 - g) 40 or more occasions

APPENDIX B: FOLLOW-UP QUESTIONNAIRE (SPRING 1999)

Thank you for agreeing to participate in this study. The purpose of this study is to collect follow-up information from individuals who participated in previous research activities within the last two years. The survey will address alcohol use, as well as items that are self-descriptive in nature. As mentioned earlier, your participation in this survey is completely voluntary, and your responses will be kept confidential. You may withdraw participation at any time. You do not have to answer any question that makes you uncomfortable. Please write in your name, social security number, and telephone number for identification purposes. By completing this survey, you are giving your informed consent to participate.

Please read all questions carefully, and respond as honestly as possible. Also, please try to write as neatly as possible so that I can read your answers clearly. **There are questions on both sides of the paper, so please make sure you fill out each side.**

This survey should take you approximately ten to fifteen minutes to complete. By completing this survey, your name will be placed in a drawing, and you will have the chance to win either a cash prize of \$50 or a gift certificate of comparable value to Younkers Dept. Store.

If you have any comments or questions regarding this survey, please contact Jenny Miller at (515) 294-5056 or through e-mail at jenmill@iastate.edu. Thanks again for your time!

Name: _____ Today's date: _____

Telephone number : _____ SS#: _____

In order to make sure that I have accurate numbers for you, may I contact the Registrar and obtain your G.P.A. and ACT scores? Yes _____ No _____

May we contact you again for additional follow-up surveys? _____ Yes _____ No

Permanent address and telephone number (so I can contact you regarding the results or the prize!):

Phone number: _____

I would _____ would not _____ like to know the results of this survey.

Please write your answers to each question on the line to the left of each number.

- _____ 1. What is your current year in school?
- a. Freshman
 - b. Sophomore
 - c. Junior
 - d. Senior
 - e. Graduate Student
 - f. Other (please fill in) _____
- _____ 2. Please indicate your current, cumulative GPA:
- a. 1.00-1.75
 - b. 1.76-2.25
 - c. 2.26-2.75
 - d. 2.76-3.25
 - e. 3.26-4.0
- _____ 3. Please select the word that you feel best describes your ethnicity:
- a. African-American
 - b. Caucasian
 - c. Latino/a
 - d. Southeast Asian (China, Japan, Korea, Vietnam, etc.)
 - e. South Asian (India, Pakistan, Bangladesh, etc.)
 - f. Native American
 - g. Pacific Islander
 - h. Other (please fill in) _____
- _____ 4. Are you currently affiliated with a sorority?
- a. yes
 - b. no
- _____ 5. Were you a member of a sorority last Spring?
- a. yes
 - b. no
- _____ 6. Where do you currently live?
- a. on-campus, in a residence hall
 - b. off-campus, in a sorority house
 - c. off-campus, in an apartment or rented house
 - d. off-campus, with my family, but close to school
 - e. I'm a commuter (live more than ten miles away from school)
 - f. other (please fill in) _____
- _____ 7. What were your living arrangements in Spring 1998?
- a. on-campus, in a residence hall
 - b. off-campus, in a sorority house
 - c. off-campus, in an apartment or rented house
 - d. off-campus, with my family, but close to school
 - e. I was a commuter
 - f. Other (please fill in) _____

Drinking survey

Please use these two response choices for the next section:

- a. yes**
- b. no**

- _____ 8. Is there anyone in your family, even as far back as a grandparent, who has had problems with alcohol (e.g., been treated for alcoholism or gotten into trouble repeatedly because of their alcohol use), or whom you'd consider to be a heavy drinker?
- _____ 9. In the last 12 months, has your use of alcohol led you to repeatedly miss work or class?
- _____ 10. In the last 12 months, has your use of alcohol frequently adversely affected your schoolwork or performance at work?
- _____ 11. In the last 12 months, has your use of alcohol led to suspension or expulsion from school?
- _____ 12. In the last 12 months, has your use of alcohol frequently led you to neglect your children? (Answer "no" if you don't have any children.)
- _____ 13. In the last 12 months, if applicable, has your use of alcohol led you to neglect household duties? (e.g., laundry, showering, etc.)
- _____ 14. In the last 12 months, have you been intoxicated while driving a motor vehicle?
- _____ 15. In the last 12 months, have you been intoxicated while operating machinery (e.g., lawnmower, tractor, chainsaw, etc.)
- _____ 16. In the last 12 months, have you used alcohol in situations in which it might have been physically dangerous to yourself or others?
- _____ 17. In the last 12 months, have you been arrested for alcohol-related disorderly conduct?
- _____ 18. In the last 12 months, have you been arrested for anything else that was a direct result of using alcohol?
- _____ 19. In the last 12 months, have you frequently gotten into physical fights while drinking alcohol?
- _____ 20. In the past 12 months, has drinking alcohol frequently caused you problems in getting along with other people?

Please use these two response choices for the next section:

- a. yes**
- b. no**

_____ 21. In the last 12 months, has drinking alcohol frequently caused trouble between you and a family member, spouse/significant other, or friend?

_____ 22. Think back over the last two weeks. How many times in the last two weeks have you had four or more drinks in a single drinking episode?

- a. Never
- b. 1-2 times
- c. 3-4 times
- d. 5-6 times
- e. more than 6 times

_____ 23. On how many occasions have you had an alcoholic beverage in the past 30 days?

- a. None
- b. 1-2 occasions
- c. 3-5 occasions
- d. 6-9 occasions
- e. 10-19 occasions
- f. 20-39 occasions
- g. 40 or more occasions

_____ 24. Describe your typical alcohol amounts now compared to what it was like approximately one year ago.

- a. I still don't drink.
- b. I drink a lot less than I did last year.
- c. I drink slightly less than I did last year.
- d. I drink about the same amount now as I did last year.
- e. I drink slightly more now than I did last year.
- f. I drink a lot more now than I did last year.

_____ 25. Describe the frequency with which you drink now compared to last year.

- a. I still don't drink.
- b. I drink less often now than I did last year.
- c. I drink about as often now as I did last year.
- d. I drink more often now than I did last year.

_____ 26. How many times per week do you typically drink?

- a. None
- b. 1-2 times
- c. 3-4 times
- d. 5-6 times
- e. 7 or more times

- _____ 27. When you drink, how many drinks do you typically have? (note: one drink is equal to one 12 oz. beer, one glass of wine, or one shot of hard liquor)
- | | |
|------------------|---------------------|
| a. I don't drink | d. 6-8 drinks |
| b. 1-2 drinks | e. 9 or more drinks |
| c. 3-5 drinks | |

If your drinking has changed in any way over the past year, please indicate some reasons why that may be.

Self-Description

For the following statements, please use these choices:

- a. rarely or none of the time
- b. some or a little of the time
- c. occasionally, or a moderate amount of time
- d. most or all of the time

Indicate how frequently you have experienced these items DURING THE PAST WEEK....

- _____ 28. I was bothered by things that usually don't bother me.
- _____ 29. I did not feel like eating; my appetite was poor.
- _____ 30. I felt that I could not shake off the blues even with help from my family or friends.
- _____ 31. I felt that I was just as good as other people.
- _____ 32. I had trouble keeping my mind on what I was doing.
- _____ 33. I felt depressed.
- _____ 34. I felt that everything I did was an effort.

For the following statements, please use these choices:

- a. rarely or none of the time**
- b. some or a little of the time**
- c. occasionally, or a moderate amount of time**
- d. most or all of the time**

Indicate how frequently you have experienced these items DURING THE PAST WEEK....

- | | |
|-------------------------------------------------|------------------------------------------|
| _____ 35. I felt hopeful about the future. | _____ 42. People were unfriendly. |
| _____ 36. I thought my life had been a failure. | _____ 43. I enjoyed life. |
| _____ 37. I felt fearful. | _____ 44. I had crying spells. |
| _____ 38. My sleep was restless. | _____ 45. I felt sad. |
| _____ 39. I was happy. | _____ 46. I felt that people dislike me. |
| _____ 40. I talked less than usual. | _____ 47. I could not get "going." |
| _____ 41. I felt lonely. | |

Below are several statements about how you feel about yourself. Please read each statement carefully. Indicate how much you agree with each statement by filling in the appropriate letter next to each item. Use any of the letters on this scale:

A	B	C	D	E	F	G
Strongly						Strongly
Disagree						Agree

- _____ 48. I feel that I'm a person of worth, at least on an equal level with (equal to) others.
- _____ 49. I feel that I have a number of good qualities.
- _____ 50. All in all, I'm inclined to feel that I'm a failure.
- _____ 51. I am able to do things as well as most other people.
- _____ 52. I feel I do not have much to be proud of.
- _____ 53. I take a positive attitude toward myself.

Below are several statements about how you feel about yourself. Please read each statement carefully. Indicate how much you agree with each statement by filling in the appropriate letter next to each item. Use any of the letters on this scale:

A	B	C	D	E	F	G
Strongly Disagree						Strongly Agree

- _____ 54. On the whole, I am satisfied with myself.
- _____ 55. I wish I could have more respect for myself.
- _____ 56. I certainly feel useless at times.
- _____ 57. At times, I think I am no good at all.

Some people experience consequences, good and bad, related to their drinking. For the next set of items, PLEASE LIST THE NUMBER OF TIMES YOU BELIEVE EACH ITEM HAS HAPPENED TO YOU IN THE PAST YEAR. If you don't know for certain, make your best guess. If an item never happened to you in the last year, please put "0".

- _____ 58. Had to go to the hospital because of drinking too much.
- _____ 59. Enjoyed feeling "buzzed."
- _____ 60. Threw up after drinking.
- _____ 61. Had difficulty remembering part of an evening after drinking, or remembered stuff but only after your friends told you about it.
- _____ 62. Went straight to bed after drinking, without changing your clothes, brushing your teeth, removing your contacts, etc.
- _____ 63. Enjoyed feeling drunk.
- _____ 64. Felt more comfortable in social situations because of drinking (i.e., the alcohol "loosened" you up).
- _____ 65. Gotten into disagreements or fights with someone after you had been drinking.
- _____ 66. Drove drunk.
- _____ 67. Felt less anxious after drinking.

Some people experience consequences, good and bad, related to their drinking. For the next set of items, PLEASE LIST THE NUMBER OF TIMES YOU BELIEVE EACH ITEM HAS HAPPENED TO YOU IN THE PAST YEAR. If you don't know for certain, make your best guess. If an item never happened to you in the last year, please put "0".

- _____ 68. Felt less depressed after drinking.
- _____ 69. Felt more depressed or anxious at least one day after drinking.
- _____ 70. Have gotten into legal trouble because of drinking (i.e., underage in possession, public intoxication, OWI, etc.), either in the dorms, through DPS or through the police.
- _____ 71. Missed classes because of drinking.
- _____ 72. Had more fun at a party because you were drinking.
- _____ 73. Had unprotected sex with a "casual" partner after drinking.
- _____ 74. Were raped or had unwanted sex after drinking.

In answering the next set of questions, please think about your current relationships with your friends.

- 1 = strongly disagree**
2 = disagree
3 = agree
4 = strongly agree

- _____ 75. There are friends I can depend on to help me, if I really need it.
- _____ 76. My friends do not respect my skills and abilities.
- _____ 77. If something went wrong, my friends would not come to my assistance.
- _____ 78. My relationships with my friends provide me with a sense of emotional security and well-being.
79. Approximately how many close friends do you have right now? _____
80. Approximately how many casual friends do you have right now? _____

In answering the next set of questions, please think about your current relationships with your parents.

1 = strongly disagree

2 = disagree

3 = agree

4 = strongly agree

_____ 81. I can depend on my parents to help me, if I really need it.

_____ 82. I feel my parents do not respect my skills and abilities.

_____ 83. If something went wrong, my parents would not come to my assistance.

_____ 84. My relationship with my parents provides me with a sense of emotional security and well-being.

In answering the next set of questions, please think about your current relationship with a romantic partner. If you are currently not in a romantic relationship, leave these items blank.

1 = strongly disagree

2 = disagree

3 = agree

4 = strongly agree

_____ 85. I can depend on my partner to help me if I really need it.

_____ 86. My partner does not respect my skills and abilities.

_____ 87. If something went wrong, my partner would not come to my assistance.

_____ 88. My relationship with my partner provides me with a sense of emotional security and well-being.

Thank you for completing this survey! Remember that your responses are confidential. Sometimes, responding to questions such as these prompts people to reflect on their lives, thoughts, and feelings. Such reflection is common, and may raise thoughts or concerns that you would like to discuss with someone else. In case this happens to you, I have listed below a number of resources available in Ames for such discussions. Please feel free to take advantage of any of the following agencies.

**Student Counseling Services (294-5056)
Planned Parenthood (232-8642)
Student Health Service (294-5801)**

**ACCESS (232-2303)
Center for Addictions Recovery (232-3206)
Richmond Center (232-5811)**

APPENDIX C. CORRELATIONS AMONG ABUSE SYMPTOMS AND ALCOHOL-RELATED BEHAVIORS.

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
Time 1 variables											
1. # of binges in last two weeks	1.00										
2. # of drinking occasions in last month	.72**	1.00									
3. # of abuse symptoms	.20*	.35**	1.00								
Time 2 variables											
4. # of binges in last two weeks	.41**	.54**	.22**	1.00							
5. # of drinking occasions in last month	.49**	.61**	.23**	.76**	1.00						
6. Frequency x amount	.44**	.53**	.28**	.76**	.85**	1.00					
7. Family history of alcohol problems	.15	.14	.13	.06	.08	.05	1.00				
8. Overdosed	.01	.09	.11	-.09	-.06	.02	-.08	1.00			
9. Enjoyed feeling "buzzed"	.39**	.48**	.28**	.55**	.62**	.68**	.08	.04	1.00		
10. Threw up	.36**	.51**	.28**	.36**	.43**	.43**	.14	.06	.54**	1.00	
11. Had blackouts	.14	.27**	.32**	.50**	.44**	.54**	.13	-.02	.51**	.20*	1.00
12. Had passouts	.25**	.31**	.33**	.44**	.44**	.56**	.10	-.01	.68**	.30**	.67**
13. Enjoyed feeling "drunk"	.29**	.39**	.30**	.44**	.51**	.58**	.07	.06	.93**	.48**	.48**
14. Felt more comfortable socially	.27*	.40**	.32**	.47**	.51**	.57**	.17*	-.03	.86**	.40**	.56**
15. Got into fights	.15	.29**	.30**	.34**	.26**	.30**	.11	-.03	.27**	.16	.25**
16. Drove drunk	.12	.21*	.30**	.41**	.33**	.39**	.14	-.03	.34**	.14	.58**
17. Felt less anxious	.35**	.34**	.19*	.41**	.44**	.51**	.15	-.00	.68**	.35**	.36**
18. Felt less depressed	.32**	.33**	.29**	.35**	.38**	.49**	.11	-.03	.55**	.28**	.34**
19. Felt more anxious/dep.	.10	.15	.27**	.21*	.26**	.24**	.13	-.02	.35**	.10	.49**
20. Legal trouble	.25**	.18*	.21*	.24**	.25**	.32**	.00	-.02	.23**	.08	.36**
21. Missed class	.27**	.36**	.33**	.33**	.41**	.50**	.09	.02	.73**	.50**	.50**
22. Had more fun	.28**	.39**	.31**	.45**	.52**	.55**	.10	.09	.87**	.40**	.58**
23. Had unsafe sex	.24**	.16	.19*	.03	.05	.07	.07	-.01	.17*	.13	.02
24. Were raped	.09	.14	.17*	.17*	.14	.18*	-.05	-.02	.30**	.21**	.26**
25. # of abuse symptoms	.21*	.33**	.40**	.44**	.50**	.55**	.11	-.06	.49**	.31**	.48**

Note: * indicates significance at the .05 level; ** indicates significance at the .01 level.

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